

Tubular stents sandwiched inside of a composite membrane and methods of making and using thereof

Abstract

A novel modification method for commercially available tubular stent is invented. The modified stents are sandwiched between a composite membrane. The polymeric sandwich (composite membrane) is durable, which undergoing several crimping and expansion circles without broken nor pinhole. The modified stents are very useful to replace the stent-graft in the procedure of aneurysm rupture prevention. The outside layer polymer has mechanical advantages such as high degree of elasticity, excellent durability and having been approved for some clinic application. The inside polymeric layer is covalently bonded to the outside polymeric layer and at the same time is cross-linking with itself. Not only this layer of polymer is biocompatible, but also it requires limited smooth muscle cells' proliferation. In some cases, the inside polymeric layer can be used as a platform of control drug release device.

The modification method could be used to produce both large stent applicable in large vessels (greater or equal to 3 mm diameter) and small stent applicable in small vessels (less than 3.0 mm diameter and can be crimped on a 1.5 mm angioplasty balloon catheter), and to produce customer length tubular stent.